

CLAIMS

1. A system for treating a dilated heart valve comprising:
a delivery device 100 comprising a delivery catheter 110 and a holding catheter 130;
a muscle elongation device 200 coupled to the holding catheter 130 and received in the delivery catheter 110, the muscle elongation device 200 including at least one clamping device 215 and disposed adjacent a distal end 116 of the holding catheter 110, the at least one clamping device 215 slidably disposed on an at least one connecting rod 220, wherein when the system is delivered to a muscle region associated with the dilated heart valve, the muscle elongation device 200 is released from the delivery catheter 110 and the at least one clamping device 215 wraps around the muscle region.
2. The system of claim 1 wherein the muscle elongation device 200 includes a first clamping device 210 fixedly attached to the at least one connecting rod 220 and a second clamping device 215 slidably disposed on the at least one connecting rod 220.
3. The system of claim 1 wherein the delivery catheter further comprises a side delivery port 114 located adjacent the distal end 116 of the delivery catheter 110.
4. The system of claim 3 wherein the side delivery port 114 further comprises two restraining members 340.
5. The system of claim 1 further comprising a locating device.
6. The system of claim 5 wherein the locating device comprises a balloon.

7. The system of claim 5 wherein the locating device comprises a guide wire.

8. The system of claim 1 wherein the holding catheter comprises biopsy forceps 550.

9. The system of claim 1 wherein the at least one clamping device 210, 215 comprise a shape-memory material.

10. The system of claim 9 wherein the shape-memory material is an elastic shape-memory material.

11. The system of claim 9 wherein the shape-memory material is a thermal shape-memory material.

12. The system of claim 9 wherein the shape-memory material is a material chosen from a group consisting of stainless steel, nitinol, tantalum, cobalt nickel alloy, platinum, titanium, a thermoplastic or thermoset polymer, or a combination thereof.

13. The system of claim 1 wherein the connecting rod 220 comprises an at least one stop 230 disposed at a proximal end of the connecting rod.

14. The system of claim 13 wherein the connecting rod 220 comprises a second stop 235 disposed at a distal end of the connecting rod.

15. A muscle elongation device 200 for treatment of a dilated heart valve, comprising:

at least one connecting rod 220;

a first clamping device 210 fixed to the at least one connecting rod; and

a second clamping device 215 slidably disposed along the connecting rod,

wherein the first clamping device 210 and the second clamping device 215 have a first diameter in a delivery configuration and a second diameter in a clamping configuration, the second diameter less than the first diameter.

16. The muscle elongation device of claim 15 further comprising:

at least one stop 230 disposed on the at least one connecting rod 220.

17. The muscle elongation device of claim 15 wherein the muscle elongation device 200 is composed of a shape memory material.

18. The muscle elongation device of claim 17 wherein the shape memory material is an elastic shape memory material.

19. The muscle elongation device of claim 17 wherein the shape memory material is a thermal shape memory material.

20. The muscle elongation device of claim 17 wherein the shape-memory material is a material chosen from a group consisting of stainless steel, nitinol, tantalum, cobalt nickel alloy, platinum, titanium, a thermoplastic or thermoset polymer, or a combination thereof.

21. A method for treating a dilated heart valve, the method comprising:

delivering a muscle elongation device 200 in a lumen of a delivery catheter 110 proximate a dilated heart valve;

positioning at least two clamping devices 210, 215 disposed along at least one connecting rod 220 of the muscle elongation device 200 on a muscle region 560 proximate the dilated heart valve;

releasing the muscle elongation device 200 from the delivery catheter 110;

wrapping the clamping devices 210, 215 about the muscle region 560;

cutting the muscle between the clamping devices 210, 215 ; and
sliding the clamping devices 210, 215 away from each other along the connecting rod.

22. The method of claim 21 further comprising locating the cardiac muscle with a location device.